UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,497	09/15/2003	Yasuyoshi Inagaki	116795	7421

25944 7590 05/10/2007

OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER
SERROU, ABDELALI

ART UNIT	PAPER NUMBER
2626	

MAIL DATE	DELIVERY MODE
05/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/661,497	INAGAKI ET AL.	
	Examiner	Art Unit	
	Abdelali Serrou	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☒ Claim(s) *13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 13 is objected to because of the following informalities: Claim 13 recites "a finite state transducer generated by the method according to claim 7", while claim 7 is a computer readable medium claim. The examiner considers the error as a typo, and interprets claim 7 as claim 9.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Mohri et al.(hereinafter Mohri) (filed on Jul. 18, 2002, and published on Jun. 26, 2003).

As per claims 1, 5, and 9, a recursive transition network creating device that creates a recursive transition network, the recursive transition network being a set of networks, each network representing a set of grammar rules based on a context-free grammar ([0008]) by states and arcs connecting the states, each arc having an input label and an output label ([0008], Fig. 3, and [0057], lines 9-14), each network having a recursive structure where each transition labeled

with a non-terminal symbol ([0054], lines 5-9) included in each of the networks is defined by another network (as in Figs. 3-4);

an arc replacement device that replaces an arc having an input label representing a start symbol included in the finite state transducer in an initial state by a network corresponding to the input label of the arc in the recursive transition network and further recursively repeats an arc replacement operation for replacing each arc, which is newly created from a replaced network, by another network in the recursive transition network ([0059] –[0060], wherein arcs (edges) with similar input symbols or output symbols are combined and replaced with a corresponding arc);

a priority calculating device that calculates a derivation probability to derive a node of a parse tree corresponding to each of arcs whose input labels are non-terminal symbols in the finite state transducer based on statistical information regarding frequency of applying grammar rules and determines an arc replacement priority in terms of an obtained derivation probability ([0070], wherein the weights of the arcs (edges) of labeled with non-terminal symbols are considered for modifying finite-state automata, and creating or deriving new nodes (states)) ; and

wherein the arc replacement device continues applying the arc replacement operation to each arc included in the finite state transducer in descending order of the arc replacement priority until the finite state transducer reaches a predetermined size ([0070], lines 19-29, wherein arcs (edges) whose output label is a non-terminal symbol are replaced to create a new state within the finite state automaton, as the one shown in Fig. 11).

As per claims 2, 6, and 10, an arc eliminating device that, after the application of the arc replacement operation by the arc replacement device terminates, eliminates arcs whose input

labels are non-terminal symbols and further performs the arc replacement operation (inherently disclosed within the process of replacing an arc within the finite state automaton, [0070], lines 19-29).

As per claims 3, 7, and 11, wherein the derivation probability for a certain node represents a probability that grammar rules are applied in order to each node on a path from a root node to the certain node in the parse tree (Fig. 3, wherein each state, 0 to 12, of the finite-state transducer T_G represents one of the rules of grammar G, shown in Fig. 1].

As per claims 4, 8, and 12, deriving the probability $P(Xr_{M(lM)})$ for node $Xr_{M(lM)}$ based on the following equation:

$$P(Xr_{M(lM)}) = \prod_{i=1}^{M} P(ri \mid ri-N+1(li-N+1),\ldots,ri-1(li-1))$$

ri represents a grammar rule, *ri(li)* represents that grammar rule *ri* is applied and grammar rule *ri+1* to be applied next is applied to a node generated by the *(li)-th* element of the right side of *ri*, and *N* is a predetermined positive integer (inherent due the nature of any conditional probability).

As per claim 13, the finite state transducer outputting one or more pieces of a parse tree as a result of a state transition when each word is inputted thereto, and a connecting device that sequentially connects each piece of the parse tree outputted by the finite state transducer (inherent in the process of generating a finite-state automaton from an input string of data for the purpose of transforming the input string of data into an output string of data, such as the transformation of voice into text or the transformation of a text in a first language into a text in a second language, [0053]).

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bangalore (U.S 7,069,215), teaches recognizing speech utterances based on the projection of a language finite-state transducer, as a language model. Ait-Mokhtar et al. (U.S 2003/0074187) teach an incremental parser for syntactically analyzing an input string, using a finite-state transducer representing context-free grammar. Privault et al. (U.S 2004/0128122) teach a method and apparatus for mapping multiword expressions to identifiers using finite-states networks. Kempe et al. (U.S 2002/0198702, and U.S 2003/0004705) teach Method and apparatus for factoring unambiguous finite-state transducers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abdelali Serrou whose telephone number is 571-272-7638. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Talivaldis I. Smits can be reached on 571-272-7628. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A. Serrou
4/27/07

DAVID HUDSPETH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600